

ABSTRACT OF THE DISCLOSURE

Metal bumps for connecting a nonconducting substrate and a chip without lateral shorting are provided. In a first preferred embodiment, an insulating layer covers the entire sidewalls of all the metal bumps. In a second preferred embodiment, predetermined portions of a first metal bump and a second metal bump are covered with an insulating layer. For example, a first predetermined portion of the sidewall of the first metal bump may be covered with an insulating layer, while a second predetermined portion of the sidewall of the second sidewall is also covered with an insulating layer.